In the United States Patent and Trademark Office

In re the application of: Jagir Razak Jainul Abdeen Hussan	)	
Filed: 10/31/2003	)	Group Art Unit: 1631
For: Multisequence Data Representation	)	Examiner: Pablo S. Whaley
Application No. 10/699,024	)	
Applicant's Docket: JP920030152US1	)	

REPLY BRIEF

This Reply Brief is responsive to Examiner's Answer of June 15, 2011.

A careful analysis of Examiner's Answer reveals that a new issue is raised therein, since it states on page 21 that "the rejection of step viii) has been modified after a further review of the teachings of Rigoutsos, who provides all the necessary teachings (and suggestions) to make a case for prima facie obviousness with regards to the step of 'updating' first and second parameters of match-set data." Appellant takes this to mean that the prior rejection has been modified in the Examiner's Answer, particularly since Examiner's Answer goes on to state immediately thereafter, "Accordingly, appellant's arguments on this point are moot."

Appellant surmises that the modification alluded to on page 21 of Examiner's Answer concerns the argument that although Rigoutsos does not specifically teach offset information having a first position parameter and a second position parameter, Rigoutsos teaches something suggestive of this. Compare Final Office action, page 6, asserting that Rigoutsos . . . "satisfies the claim language for a first and second position

parameter," with Examiner's Answer, page 19, asserting that Rigoutsos "provides a notation . . . which suggests the use of first and second position parameters." See also Appeal Brief, page 18, first full paragraph ("The Office action states . . . 'Rigoutsos does not teach a first position parameter of each match-set entry denoting a location in the sequence and a second position parameter . . .' and states . . . appellant has engaged in attacking the references separately. Nevertheless, the present Office action also immediately thereafter states . . . 'Rigoutsos . . . satisfies the claim language for a first and second position parameter").

This new basis for rejection comes late in the process and is not necessitated by any amendment or argument newly presented by Appellant, but rather due to lack of clear analysis in the Final Office action, particularly regarding what specific citations and arguments relate to what specific claim limitations. In addition to page 18 mentioned above, this was also pointed out in Appeal Brief, page 17, paragraph 4, and page 22, first full paragraph. Nevertheless, the latest rejection, which is now in Examiner's Answer, on its face still does not address all the claim limitations.

In the same manner in which the Final Office action failed to address claim limitations pointed out by appellant in earlier replies, Examiner's Answer does not offer any teaching or suggestion in the prior art for certain claim limitations pointed out by appellant in the Appeal Brief. See Appeal Brief, pages 17-19 ("Appellant has been impeded by a lack of clarity in the Office actions with regard what specific citations and arguments relate to what specific claim limitations . . . While the Office action, page 6, asserts that Rigoutsos . . . 'satisfies the claim language for a first and second position parameter,' . . . Nowhere does Rigoutsos teach or suggest offset information that 'comprises a first and second position parameter . . . wherein the first position parameter of each match-set data structure entry denotes a location in the sequence and the second position parameter of each match-set data structure entry denotes an offset from the location," as claimed. Nor do any of the five references cited, alone or in combination.' "). With regard to this particular claim limitation, the Final Office action and the Examiner's Answer both merely argue that the prior art teaches (Office action) or suggests (Examiner's Answer) something broader than what the limitation actually states, i.e., merely "a first and second position parameter." They

do not even assert that any suggestion exists in the prior art regarding the rest of the claim limitation, i.e., "the first position parameter of each match-set data structure entry denotes a location in the sequence and the second position parameter of each match-set data structure entry denotes an offset from the location." All the more certainly, they do not present any argument about how the prior art suggests all aspects of this claim limitation. [1]

For reasons explained below, appellant disagrees with the argument now presented that "Rigoutsos makes obvious the use of offset information having a first position parameter and a second position parameter." But even if the argument is accepted, no prima facie case is made, since the rejection on its face does not address all of what is claimed. As stated in the Appeal Brief, page 22, regarding the final Office action, the Examiner's Answer, likewise, "generally alleges that the cited references teach or suggest various matters that [it] does not clearly relate to the exact language of the claim. Even if those matters . . . are construed to relate to the above recited claim limitations, appellant respectfully submits that these general allegations are too vague to constitute the sort of 'substantial reasoning' required for a prima facie case of obviousness, as required under KSR. Further, MPEP 706.02(j) states that 'To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the

[1] See also, Appeal Brief, pages 20-22 , stating that Office action assertions discussed therein "impermissibly substitute conclusory statements for teaching in the prior art and articulated reasoning . . . Although the Office action refers to what it considers to be obvious in view of a combination of the five cited references, Rigoutsos is the only actual prior art teaching cited in the Office action regarding identifying "a sequence identification . . . and offset information to determine a position within the sequence where the matching subsequence of the sequence is located, wherein the offset information comprises a first and second position parameter" and "viii) . . . wherein the first position parameter of each match-set data structure entry denotes a location in the sequence and the second position parameter of each match-set data structure entry denotes an offset from the location," as claimed. Likewise, Rigoutsos is the only teaching cited in the Office action regarding "after receiving the selection the computer system updates the first and second parameters of the entries in the match-set data structure , the updating being responsive to the position of the selected at least first one of the replets," as claimed . . . [N]o reasoned basis is provided for the conclusion that the above recited claim limitations would have been obvious . . . [T]he Office action does not even clearly assert that Rigoutsos teaches or suggests what is actually claimed, but rather makes an assertion about something that is only vaguely related to what is explicitly and particularly claimed."

claimed invention to have been obvious in light of the teachings of the references.' This burden has not been met."

Appellant disagrees with the argument now presented that "Rigoutsos makes obvious the use of offset information having a first position parameter and a second position parameter." Examiner's Answer supports this argument by pointing out, on pages 19-20, that "Rigoutsos provides a notation (indicated as LsP) that allows for the COMBINED representation of a sequence ID parameter (i) and an offset position parameter (j) denoting sequence matches at a specific offset, collectively represented as (i,j); see p. 56, Col. 2, ¶3 to bottom, and Figure 1, which suggests the use of first and second position parameters, because the sequence IDS taught by Rigoutsos are associated with positions (in a sequence) and the offset parameter taught by Rigoutsos represents the offset position of the matching sequence."

As explained in the Appeal Brief, page 19, the teaching by Rigoutsos cited in the rejection concerns a parameter $L_S(P)$, in which "{(i, j) | sequence s_i matches P at offset j}." Rigoutsos provides a specific example for a set of sequences S = {LFAADCHFFEDTR, LKLALCHESEDR, AFAGCHADELFT} , in which parameter L_S applies as follows:

L_S ('A.CH. . E') = {(1,4), (2,4), (3,3)}

In the first set (1,4) of Ls, for example, the "1" is the for the subscript "i" in "sequence s_i" identifier, which indicates the first sequence, "LFAADCHFFEDTR" in the set of sequences and the "4" indicates that the string "A.CH. . E" of L_S is found in that first sequence beginning at an offset of 4. Thus, correctly understood, the first parameter of Rigoutsos that is cited by Examiner's Answer and relied upon for the rejection is an index identifying one of three enumerates sequences {LFAADCHFFEDTR, LKLALCHESEDR, AFAGCHADELFT} for which a match is sought. It does not identify a position within a sequence. Consequently, the assertion in the Examiner's Answer that "the sequence IDS [i.e., sequence identifiers] taught by Rigoutsos are associated with

positions (in a sequence)," misconstrues the teaching of Rigoutsos and, by the comparison, misconstrues the claims of the present application.

To explain more specifically, this teaching by Rigoutsos about a first parameter that indicates one of a number of enumerated sequences and a second parameter that indicates an offset location within an examined sequence where there is a match to the indicated one of the enumerated sequences, does not suggest "the first position parameter of each match-set data structure entry denotes a location in the sequence and the second position parameter of each match-set data structure entry denotes an offset from the location." The sequences {LFAADCHFFEDTR, LKLALCHESEDR, AFAGCHADELFT} of Rigoutsos are like the "replets" recited in the claims of the present application. The replets are compared to a sequence to find matches. See, e.g., claim 14 ("comparing each replet by the computer system to a sequence for determining by the computer system a subsequence of the sequence that matches each replet"). In the teachings of the present application, as particularly recited in the claims, a match-set data structure has entries for each replet. See, e.g., claim 14 ("the match-set data structure having respective entries for the respective replets"). The parameter taught by Rigoutsos that indicates one of the enumerated sequences (i.e., "replets" in the nomenclature of the present application) {LFAADCHFFEDTR, LKLALCHESEDR, AFAGCHADELFT} is like a parameter that points to one of the match-set data entries for one of the replets in the subject claims of the present case.

In contrast to the "first position parameter" recited in the claims of the present application, this parameter of Rigoutsos cited by Examiner's Answer is not a parameter that conveys information about a position, it is an index parameter that identifies one of a number of enumerated replets. The existence of this replet-identifying parameter cited by Rigoutsos, even combined with one location parameter, does not suggest the use of two location parameters, and certainly does not suggest a "first position parameter of each match-set data structure entry denotes a location in the sequence," i.e., a location in "a sequence where a match occurs" for the replet, as recited in the

claim, and a "second position parameter of each match-set data structure entry denotes an offset from the location."

As stated herein above, a modification is alluded to on page 21 of Examiner's Answer. The Answer considers that this modification makes a previous argument of appellant moot. As explained herein above, appellant surmises that the modification concerns the argument that although Rigoutsos does not specifically teach offset information having a first position parameter and a second position parameter, Rigoutsos teaches something suggestive of this. Accordingly, appellant has responded herein above to arguments in Examiner's Answer regarding this matter. However, it is not entirely clear whether the modification to which Examiner's Answer alludes concerns this or some other matter. Therefore, appellant now turns to other arguments presented in the Examiner's Answer to avoid any penalty for failing to find a modification therein that renders moot some argument by appellant in the Appeal Brief.

Examiner's Answer states on page 20, "Rigoutsos provides a method for identifying where the matching subsequences occur within a larger sequence, provides what sequences are matching, and provides the offset positions of these subsequence within the larger sequence [p. 56, col. 2, ¶3-bottom]." However, in the teaching of Rigoutsos, the providing of the offset position of a subsequence within a larger sequence is, itself, "the method [i.e., the one position parameter] for identifying where the matching subsequences occur within a larger sequence." See discussion herein above, explaining Rigoutsos's teaching about the position of string "A.CH. . E" beginning at an offset of 4. The assertion in Examiner's Answer inflates the teaching of Rigoutsos.

Regarding updating first and second parameters of match-set data, Examiner's Answer states at pages 20 and 21, "it would have been obvious to one of ordinary skill in the art to have "updated" the first and second parameters associated with the match-data sets (made obvious by Rigoutsos), since ANY computer generated match sequence taught by Rigoutsos is associated with a sequence ID parameter and an offset parameter. Therefore newly generated match sequences are "updated" with new

position and offset parameters. Furthermore, one of ordinary skill in the art would have recognized computational methods for updating parameters, such as by generating new patterns based on positional and offset information, as shown by Rigoutsos; page 58, col. 1 and Fig. 3, which suggests "updating" match-set data based on the position of selected replets. The motivation would have been to generate all matching patterns and quickly discard non-optimal patterns, as suggested by Rigoutsos; p. 58, col. 2." The above argument about updating presumes knowledge of the claimed first and second position parameters, as recited in the claims of the present case, including specific limitations about the particular nature of the parameters, as discussed herein above. Appellant disagrees that such parameters were known or suggested in the prior art, as explained herein above. Further, the particular nature of the parameters facilitate the updating, unlike in the prior art. See the following discussion.

Examiner's Answer states on page 21, "It is additionally noted that the neither applicant's arguments, the claims, nor the specification provides any illuminating guidance as to what is required for updating parameters, wherein the updating is 'being responsive to the position of selected' replets (i.e. sequences), as recited in the claims. " However, appellant is aware of no authority that requires the claims to provide illuminating guidance about how to practice what is claimed. No such authority is cited in Examiner's Answer. As to appellant's arguments, they have generally focused on particularly pointing out aspects of the claims that are not suggested by the prior art. The claims do not recite or illuminate details of how the updating is performed, other than to recite that the updating is responsive to the position parameters, as discussed herein above, since appellant contends this is sufficient to distinguish the claimed invention from the prior art. Further, the specification does teach in specific detail what is required for updating parameters, and explains advantages of practicing the particular position parameter configuration taught by the present application, which facilitates the updating, as the specification explains. To provide just one example, see the following excerpt from the specification, pages 9-10 (emphasis added):

> Each input sequence is represented using an ordered set of Match-Set entries and a backbone. Each match-set entry represents a subsequence that starts at the location 'k' of

the sequence and the variation information can be obtained from the variation table of the replet by using the indirection table for the replet. For these replets the parameter 'δ' is zero in the corresponding Match-set entries.

Whenever a subsequence could be represented by one or more replets or one or more combination of replets, a choice is made among them and only one among these is used to represent the subsequence.

The other replets also have an entry in their Match-set entries against the sequences, which enables processing based on these replets. Since the matching subsequence is removed from the sequence, these entries become invalid. **The following updates are performed** to make these entries valid and enable rebuilding of the subsequence that these replets match. The parameters 'k' and 'δ' are adjusted. The parameter 'k' of the Match-Set entry corresponding to replet $\wp$ is set to the 'k' of the replet $\wp_1$ that is chosen to represent the subsequence that replet $\wp$ matches partially or completely. Parameter 'δ' is set to the number of positions before (-δ), or after (+δ) 'k' of $\wp_1$ that replet $\wp$ starts matching the subsequence.

The parameter 'δ' allows such mapping, which is difficult to otherwise perform. Thus the subsequence can be reconstructed using the information in $\wp_1$ and reading this information from the offset 'δ'. Thus the Match-Set of all the affected replets are modified to reflect the correct method of access. Connecting the Match-Set entries of all the replets such that the sequence they represent can be traced using pointers among the replets generates a replet-sequence matrix as shown in Fig. 3. Fig. 3 provides a schematic representation of the data structure described herein. Each row of Fig. 3 represents a Match-Set of a replet, and each column represents a sequence that is stored. When the arrows are traversed from the column heading, all the replets matching the sequence are obtained. When the arrows are traversed from the row heading, all the sequences in which the replet has matches are obtained.

The replet-sequence matrix [Table 3], the variation table [Table 4]and the respective backbones of the sequences with the indirection table [Table 5] completely capture all the information stored in the sequences.

Additional description in the specification includes explanation of specific examples illustrated in tables set out therein, including Tables 3-5.

In reviewing the Appeal Brief, appellant has discovered a typographical error on page 16, line 16. The existence of the error and the intended meaning are both understandable from the context. However, to explicitly correct this error, page 16, lines 13-66, should read follows:

> To make an analogy, it may be said in a mathematical problem that 'x is a function of u and v,' for example. While this terminology does not specify an exact formula involving u and v, it does quite definitely indicate that the computation of x requires values for ~~a and b~~ u and v.

Appellant will separately submit a Correction to Appeal Brief regarding this typographical error.

Respectfully submitted,

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